

New records of Auriculariales, Hymenochaetales and Polyporales (Fungi: Agaricomycetes) for the Caatinga Biome

Elisandro Ricardo Drechsler-Santos^{1*}, Leif Ryvarden², José Luiz Bezerra³, Tatiana Baptista Gibertoni⁴, C. A. Salvador-Montoya¹ and Maria Auxiliadora de Queiroz Calvacanti⁴

- 1 Universidade Federal de Santa Catarina, Centro de Ciências Biológicas, Departamento de Botânica, Laboratório de Micologia, Programa de Pós Graduação em Biologia Vegetal. CEP 88010-970. Florianópolis, SC, Brazil.
 - 2 University of Oslo, Department of Biology; P.O. Box 1066 Blindern N-0316; Oslo - Norway.
 - 3 Universidade Estadual de Santa Cruz, Departamento de Ciências Agrárias e Ambientais; Rod. Ilhéus-Itabuna Km 16. CEP 44380-000. Ilhéus, BA, Brazil.
 - 4 Universidade Federal de Pernambuco, Departamento de Micologia; Av. Prof. Nelson Chaves s/n°. CEP 50670-901. Recife, PE, Brazil.
- * Corresponding author. E-mail: drechslersantos@yahoo.com.br

ABSTRACT: Macrofungi from exclusive Brazilian biome of semi-arid region are poorly known and more efforts are necessary to document the diversity and distribution of this group among all the different ecosystems of the Caatinga. Sixty one exsiccata kept at ALCB, CEPEC, HUVA and IPA herbaria were revised which corresponded to 36 species. Fourteen of these, *Auricularia polytricha*, *Amauroderma partitum*, *A. sprucei*, *Dichomitus cavernulosus*, *Flabellophora parva*, *Flaviporus hydrophilus*, *Ganoderma resinaceum*, *Hexagonia papyracea*, *Perenniporia aurantiaca*, *Phellinus shaferi*, *Polyporus ianthinus*, *Rigidoporus lineatus*, *R. ulmarius*, and *Steccherinum reniforme*, are first records for the Caatinga biome.

Caatinga, a seasonally dry tropical forest (Pennington *et al.* 2000), is an exclusive biome mostly covering the Brazilian Semi-arid Region (3–7° S and 35–45°W, 955.000 Km²). For a long time, the region has been poorly investigated due to its apparent low biodiversity. However, it is currently considered the most environmentally diverse landscape in Brazil and might reveal high levels of biodiversity (Queiroz *et al.* 2006).

Considering the paucity of information on macrofungi from Caatinga, revisions of herbarium material were published as attempts to recognize the fungal diversity in this unique biome (Drechsler-Santos *et al.* 2008b, 2009). More recently, new records were added by Drechsler-Santos *et al.* (2010, six species of *Phellinus* Quél.), Gibertoni *et al.* (2011, three species of *Trichaptum* Murrill), and by Baltazar *et al.* (2012, seven species of *Hymenochaetales* Oberw. and *Polyporales* Gäum.). Also, Drechsler-Santos *et al.* (2012a, b) described two new species, *Daedalea ryvardenica* Drechsler-Santos and Robledo and *Panus parvus* Drechsler-Santos and Wartchow, respectively, and established four new records of lentinioid species for the Caatinga.

Herbaria Alexandre Leal Costa (ALCB, Universidade Federal da Bahia), André Maurício Vieira de Carvalho (CEPEC, Comissão Executiva do Plano da Lavoura Cacaueira CEPLAC), Francisco José de Abreu Matos (HUVA, Universidade Estadual Vale do Acaraú) and Dárdano de Andrade Lima (IPA, Instituto Agrônomo de Pernambuco) house macrofungi collections considered important for documenting fungal diversity in the Caatinga and for advancing our understanding of species distributions. Some are historical collections from prominent Brazilian mycologists such as Pe. Camille Torrend (ALCB) and Dr. Augusto Chaves Batista (IPA). The nomenclatural situation and preservation conditions of most of these specimens

are poorly known (Maia *et al.* 2007) and in need of immediate attention. We present some results after careful examination of preserved exsiccata.

The taxonomic (macro- and micromorphology) analysis of 61 exsiccata from ALCB (16), CEPEC (36), IPA (6), and HUVA (3) revealed that they correspond to 36 species distributed among *Agaricales* Underw., *Auriculariales* J. Schröt., *Gloeophyllales* Thorn, *Hymenochaetales*, *Polyporales*, and *Russulales* Kreisel ex P.M. Kirk, P.F. Cannon and J.C. David. Duplicates of some CEPEC and IPA materials were deposited at O (University of Oslo, cfr. Holmgren *et al.* 1990). Most of the collections are considered important, because they correspond to unique records or to old collections of single species, sometimes infrequently recorded or recorded for the first time from Caatinga biome. The 14 new species records are as noted below.

Amauroderma partitum (Berk.) Wakef., Bull. Misc. Inf., Kew: 242 (1934). (Figure 1C)

(*Polyporales*, *Ganodermataceae* Donk)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, J.L. Bezerra 680 (CEPEC1067, O).

Notes on distribution: neotropical species, from Brazil to Venezuela and Guyana, probably wide spread in the Amazon basin as suggested by Ryvarden (2004). In Brazil, this species was recorded for the biomes of Amazonia and Atlantic Rain Forest (northeast region) biomes (Gomes-Silva *et al.* 2010).

Amauroderma sprucei (Pat.) Torrend, Brotéria, sér. bot. 18: 121 (1920)

(*Polyporales*, *Ganodermataceae*)

Material examined: BRASIL. Bahia: Utinga, C. Torrend (ALCB30324).

Notes on distribution: neotropical species with records in the Brazilian biomes of Atlantic Rain Forest (from South to Northeast), Amazon (Furtado 1981, Ryvarden 2004, Campacci and Gugliotta 2009, Gugliotta *et al.* 2012). The widely geographical distributed and the morphological variation of this taxon may suggest that the species could be treated as a taxonomic complex. Decock and Herrera-Figueroa (2006, with pictures pg. 5) determined a strict sense for *A. sprucei* and showed that the species is currently known from Brazil, Venezuela, French Guyana, Costa Rica, Belize, and Cuba, suggesting the later as a Northern limit of distribution (Decock and Herrera-Figueroa 2006). Collections from South Brazil should be taxonomically revised, adopting the strict sense of Decock and Herrera-Figueroa (2006), and then, the Southern limit of the distribution of *A. sprucei* could be delimited.

Auricularia polytricha (Mont.) Sacc., Atti Inst. Veneto Sci. lett., ed Arti, Sér. 6 3: 722 (1885). (Figure 1A).

(*Auriculariales*, *Auriculariaceae* Fr.)

Material examined: BRASIL. Bahia: Mundo Novo, *C. Torrend* sn. (ALCB30364); *C. Torrend* sn. (ALCB30365).

Notes on distribution: widely distributed species with occurrences in the tropical and subtropical regions (Lowy 1952). In Brazil, it was recorded for the biomes: Atlantic Rain Forest, Amazon and Cerrado (Jesus 1996; Drechsler-Santos *et al.* 2008a; Gibertoni and Drechsler-Santos 2010).

Dichomitus cavernulosus (Berk.) Masuka and Ryvarden, Mycol. Res. 103(9): 1127 (1999). (Figure 2B).

(*Polyporales*, *Polyporaceae* Fr. Ex Corda)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, *J.L. Bezerra* 679 (CEPEC1066, O); *J.L. Bezerra* 673 (CEPEC1060, O).

Notes on distribution: this species is widespread in tropical America and Africa (Masuka and Ryvarden 1999). In Brazil, it was recorded for the Atlantic Rain Forest, Amazon, and Cerrado biomes (Gomes-Silva *et al.* 2011b; Abrahão *et al.* 2012; Gugliotta *et al.* 2012). This seems to be the most widely distributed *Dichomitus* species in Brazil.

Flabellophora parva Corner, Beih. Nova Hedwigia 86: 42 (1987). (Figure 2C).

(*Polyporales*, *Polyporaceae*)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, *J.L. Bezerra* 696 (CEPEC1083, O).

Notes on distribution: neotropical species, known only from the type locality in Peru and Brazil (Baltazar *et al.* 2012). In Brazil, there were only two records, from South (Parana state) and, recently, from Northeast Atlantic Rain Forest (Baltazar *et al.* 2012).

Flaviporus hydrophilus (Berk. and M.A. Curtis) Ginns, Can. J. Bot. 58(14): 1583 (1980). (Figure 1H-I).

(*Polyporales*, *Meruliaceae* P. Karst.)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, *J.L. Bezerra* 667 (CEPEC1054, O).

Notes on distribution: neotropical species according to Ginns (1980). In Brazil, this species has been recorded only for the Atlantic Rain Forest from South to Northeast

(Baltazar and Gibertoni 2009, Baltazar *et al.* 2012). Specimens from different regions should be taxonomically studied as an attempt to delimit the taxon and its geographical distribution.

Ganoderma resinaceum Boud., Patouillard, Bull. Soc. mycol. Fr. 5: 72 (1890). (Figure 1D).

(*Polyporales*, *Ganodermataceae*)

Material examined: BRASIL. Pernambuco: Caruaru, 26.I.1940, *A.R. Campos* 13-639 (IPA339 cx. 31, as *Ganoderma lucidum* Karst., URM80831, O).

Notes on distribution: cosmopolitan species (Ryvarden 2004). In Brazil, this species was recorded for the Atlantic Rain Forest, Amazon, and Cerrado biomes (Baltazar and Gibertoni 2009; Gibertoni and Drechsler-Santos 2010; Gomes-Silva *et al.* 2011a). Although, widely distributed, as showed by Gugliotta *et al.* (2012), *G. resinaceum* presents great morphological variation as well, suggesting that the species might be a taxonomic complex.

Hexagonia papyracea Berk., Ann. Mag. nat. Hist., Ser. 2 9: 196 (1852). (Figure 2D)

(*Polyporales*, *Polyporaceae*)

Material examined: BRASIL. Ceará: Sobral, Fazenda Experimental Vale do Acaraú, 11.VIII.2004, *R.A.A. Oliveira* 66 (HUVA).

Notes on distribution: neotropical species (Gilbertson and Ryvarden 1986). In Brazil, there are records for the Atlantic Rain Forest, Amazon, Pantanal and Cerrado biomes (Groposso and Loguercio-Leite 2005, Bonini *et al.* 2008, Abrahão *et al.* 2012, Gugliotta *et al.* 2012). This species was previously recorded for the Caatinga biome by Góes-Neto and Baseia (2006), however Drechsler-Santos *et al.* (2009) excluded it from the checklist because the exsiccate (ALCB) was not found. Therefore, the material studied here represents the validation of *H. papyraceae* in the Caatinga biome.

Perenniporia aurantiaca (A. David and Rajchenb.) Decock and Ryvarden, Mycol. Res. 103(9): 1140 (1999). (Figure 2E).

(*Polyporales*, *Polyporaceae*)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, *J.L. Bezerra* 675 (CEPEC1062, O).

Notes on distribution: neotropical species (Decock and Ryvarden 1999). In Brazil, this species was recorded for the Atlantic Rain Forest and Amazon biomes (Gibertoni *et al.* 2004b; Gomes-Silva and Gibertoni 2009).

Phellinus shaferi (Murrill) Ryvarden, Norw. J. Bot. 19: 235 (1972). (Figure 1B)

(*Hymenochaetales*, *Hymenochaetaceae* Donk)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, *J.L. Bezerra* 677 (CEPEC1064).

Notes on distribution: tropical species recorded from America and Africa (Ryvarden and Johansen 1980, Ryvarden 2004). In Brazil, this species was reported for the Atlantic Rain Forest, Amazon (Baltazar and Gibertoni 2009; Gomes-Silva and Gibertoni 2009). However, we suggest that some specimens from different regions

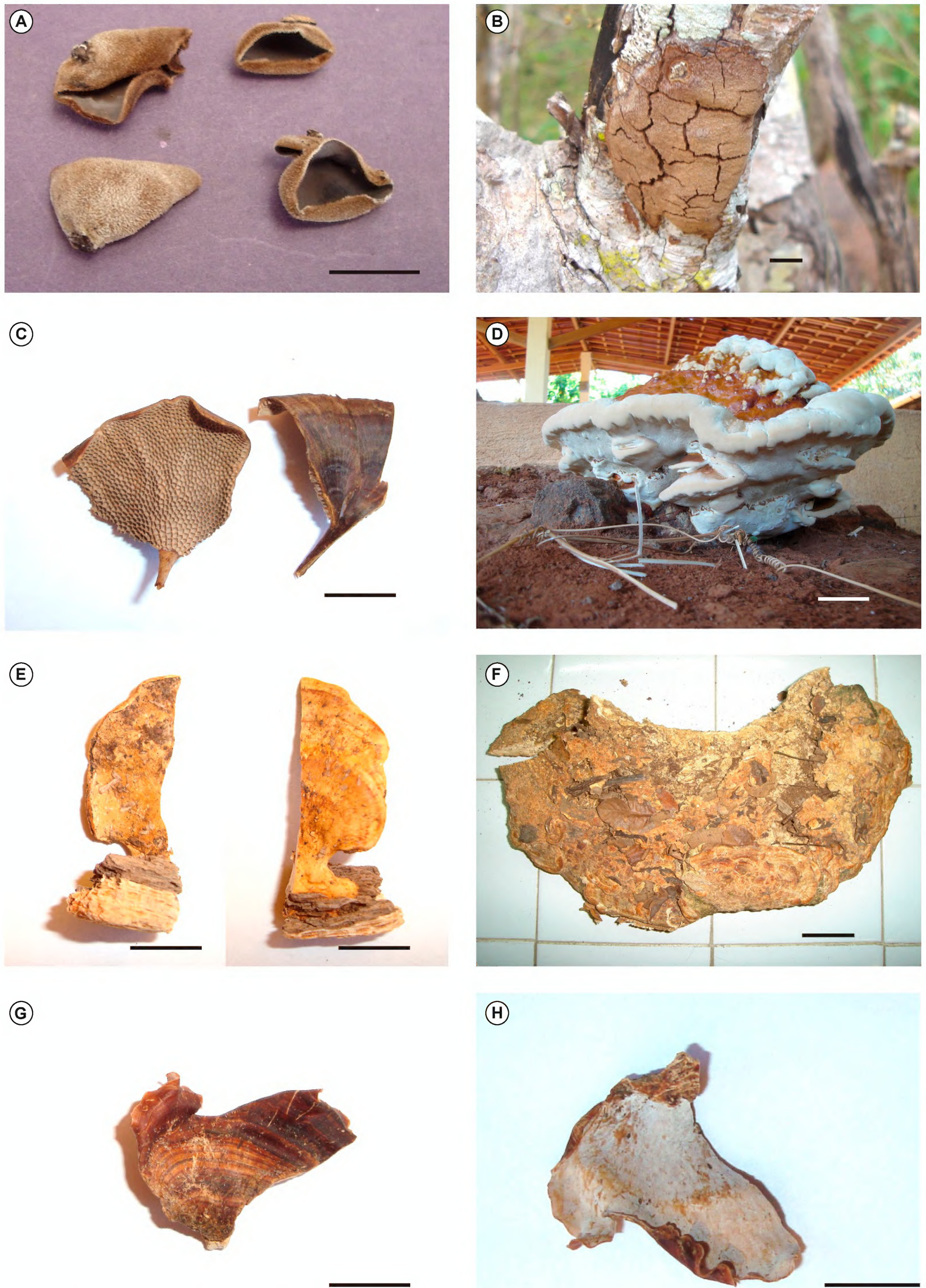


FIGURE 1. Basidiomes. (A) *Auricularia polytricha*; (B) *Phellinus shaferi*; (C) *Amauroderma partitum*; (D) *Ganoderma resinaceum*; (E-F) *Rigidoporus lineatus*; (G) *R. ulmarius*; (H-I) *Flaviporus hydrophilus* (scale bar: A-C, E-F, H-I = 1cm; D-G = 5cm).

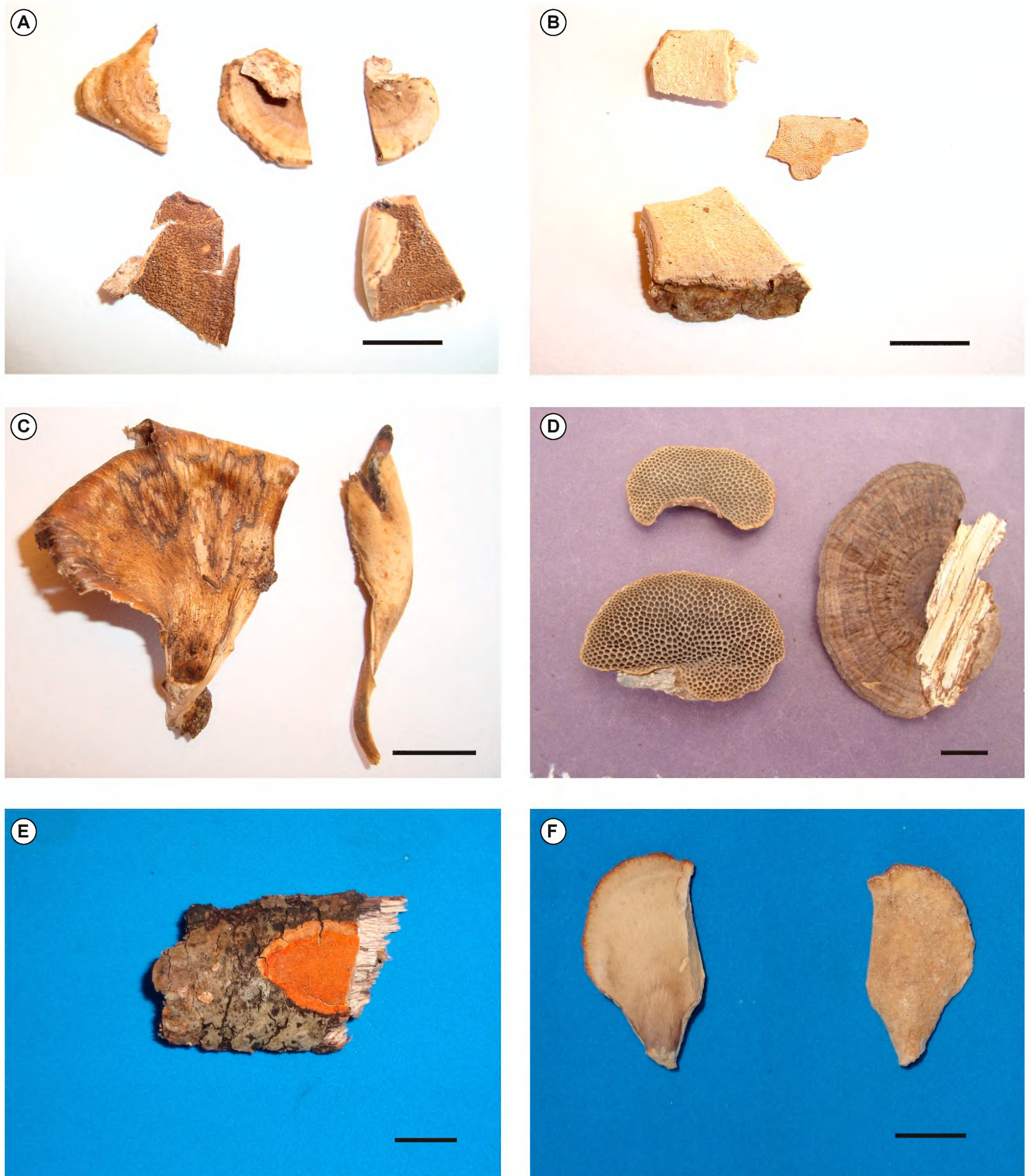


FIGURE 2. Basidiomes. (A) *Steccherinum reniforme*; (B) *Dichomitus cavernulosus*; (C) *Flabellophora parva*; (D) *Hexagonia papyraceae*; (E) *Perenniporia aurantiaca*; (F) *Polyporus ianthinus* (scale bar = 1cm).

should be taxonomically revised as an attempt to delimit the taxon and its geographical distribution.

Polyporus ianthinus Gibertoni and Ryvarden, Synopsis fungorum 18: 53 (2004). (Figure 2F)

(Polyporales, Polyporaceae)

Material examined: BRASIL. Bahia: Mucugê, Parque Municipal Sempre Viva, 28.XII.2006, J.L. Bezerra 445 (CEPEC618, O).

Notes on distribution: neotropical species, known only

for the Guyana and Brazil (Gibertoni *et al.* 2004a). In Brazil, this species was recorded for the biomes of Atlantic Rain Forest (type locality) and Amazon (Gomes-Silva and Gibertoni 2009).

Rigidoporus lineatus (Pers.) Ryvarden, Norw. Jl Bot. 19: 236 (1972). (Figure 1E-F).

(Polyporales, Meripilaceae Jülich)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, J.L. Bezerra 668

(CEPEC1055, O).

Notes on distribution: pantropical species, widely distributed in America, Asia and Africa (Ryvarden and Johansen 1980). In Brazil, this species is widely distributed as well, recorded for the biomes of Atlantic Rain Forest, Cerrado, Amazon (Drechsler-Santos et al. 2008a; Gomes-Silva and Gibertoni 2009; Abrahão et al. 2012; Gugliotta et al. 2012). This species deserves taxonomic attention, besides its wide geographical distribution, *R. lineatus* presents high morphological variation, suggesting that the species might be a taxonomic complex.

Rigidoporus ulmarius (Sowerpor) Imazeki, Bull. Gov. Forest Exp. St. Tokyo 57: 119 (1952). (Figure 1G).

(Polyporales, Meripilaceae)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, J.L. Bezerra 717 (CEPEC1108, O).

Notes on distribution: species with a wide distribution around the world (Ryvarden and Johansen 1980). On the other hand, in Brazil, was recorded for the Southern Atlantic Rain Forest and Amazon biomes (Gerber and Loguercio-Leite 1997; Gomes-Silva and Gibertoni 2009; Westphalen et al. 2010).

Steccherinum reniforme (Berk. and M.A. Curtis) Banker, Mem. Torrey bot. Club 12: 127 (1906). (Figure 2A).

(Polyporales, Meruliaceae P. Karst.)

Material examined: BRASIL. Bahia: Barra do Choça, Hotel Fazenda São José, 22.IV.2008, J.L. Bezerra 715 (CEPEC1106, O).

Notes on distribution: neotropical species (Maas Geesteranus 1974). In Brazil, *S. reniforme* is widely distributed previously known from Atlantic Rain Forest, Amazon, and Cerrado biome (Campos-Santana and Loguercio-Leite 2010; Games-Silva and Gibertoni 2009; Abrahão et al. 2012).

ACKNOWLEDGMENTS: We would like to thank the curators of ALCB, CEPEC, IPA and HUVA Herbaria, for authorizing the access to the collections; Aristóteles Góes-Neto, Cony Decock, Diogo H. Costa-Rezende and Marco A. Borba-Silva for their exceptional contributions to this work. This research was supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq, Projects: Universal 478973/2006-3 and 479961/2007-7, Pesquisa em Biodiversidade do Semi-árido 010105.00/2004/PPBio. CNPq granted the first author PhD financial support (modalities: GD 141072/2006-7 and SWE 201847/2008-6) and provided grants to M.A.Q. Cavalcanti.

LITERATURE CITED

- Abrahão, M.A., A.M. Gugliotta and V. L. R. Bonini. 2012. Xylophilous *Agaricomycetes* (Basidiomycota) of the Brazilian Cerrado. *Check List* 8(5): 1102–1116.
- Baltazar, J.M. and T.B. Gibertoni. 2009. A checklist of the aphyllorhizoid fungi (Basidiomycota) recorded from Brazilian Atlantic Forest. *Mycotaxon* 109: 439–442.
- Baltazar, J.M., E.R. Drechsler-Santos, L. Ryvarden, M. A. Q. Cavalcanti and T. B. Gibertoni. 2012. Contribution to the knowledge of polypores (*Agaricomycetes*) from the Atlantic forest and Caatinga, with new records from Brazil. *Mycosphere* 3(3): 267–280.
- Bonini, V.L., A.K.M. Oliveira, J. R. Quevedo and A. M. Gugliotta. 2008. Fungos macroscópicos do Pantanal do Rio Negro, Mato Grosso do Sul, Brasil. *Hoehnea* 35(4): 489–511.
- Campacci, T.V.S. and A.M. Gugliotta. 2009. A review of *Amauroderma* in Brazil, with *A. oblongisporum* newly recorded from Neotropics. *Mycotaxon* 110: 423–436.
- Campos-Santana, M. and C. Loguercio-Leite. 2010. Mycodiversity of xylophilous *Basidiomycetes* (Basidiomycota, Fungi) in Mondaí, Santa Catarina, Brazil II: A new addition. *Biotemas* 23 (1): 13–18.
- Decock, C. and S. Herrera-Figueroa. 2006. Neotropical *Ganodermataceae* (Basidiomycota): *Amauroderma sprucei* and *A. dubiopsanum*. *Cryptogamie Mycologie* 27(1): 3–10.
- Decock, C. and L. Ryvarden. 1999. Studies in neotropical polypores. Some coloured resupinate *Perenniporia* species. *Mycological Research* 1-3(9): 1138–1144.
- Drechsler-Santos, E.R., M.A.Q. Cavalcanti, C. Loguercio-Leite and G. L. Robledo. 2012a. One Neotropical *Daedalea* species: *Daedalea ryvardenica* sp. nov. *Kurtziana* 37(1), 65–72.
- Drechsler-Santos, E.R., T.B. Gibertoni, A. Góes-Neto and M.A.Q. Cavalcanti. 2009. A re-evaluation of the lignocellulolytic *Agaricomycetes* from the Brazilian semi-arid region. *Mycotaxon* 108: 241–244.
- Drechsler-Santos, E.R., C. Groposo and C. Loguercio-Leite. 2008a. Additions to the knowledge of lignocellulolytic *Basidiomycetes* in forests from Santa Catarina, Southern Brazil. *Mycotaxon* 103: 197–200.
- Drechsler-Santos, E.R., P.J.P. Santos, T.B. Gibertoni and M.A.Q. Cavalcanti. 2010. Ecological aspects of *Hymenochaetaceae* in an area of Caatinga (semi-arid) in Northeast Brazil. *Fungal Diversity* 42(1): 71–78.
- Drechsler-Santos, E. R., F. Wartchow, I. G. Baseia, T. B. Gibertoni and M. A. Q. Cavalcanti. 2008b. Revision of the Herbarium URM I. *Agaricomycetes* from the semi-arid region of Brazil. *Mycotaxon* 104: 9–18.
- Drechsler-Santos, E.R., F. Wartchow, V.R.M. Coimbra, T.B. Gibertoni and M.A.Q. Cavalcanti. 2012b. Studies on lentinoid fungi (*Lentinus* and *Panus*) from the semi-arid region of Brazil. *Journal of the Torrey Botanical Society* 139(4): 437–446.
- Furtado, J.S. 1981. *Taxonomy of Amauroderma* (Basidiomycetes, Polyporaceae). Memoirs of the New York Botanical Garden. Bronx, NY, 34. 109p.
- Gerber, A.L. and C. Loguercio-Leite. 1997. New records of polypores (Aphyllorhizales) from Southern Brazil. *Mycotaxon* 62: 305–318.
- Gibertoni, T.B. and E.R. Drechsler-Santos. 2010. Lignocellulolytic *Agaricomycetes* from the Brazilian Cerrado biome. *Mycotaxon* 111: 87–90.
- Gibertoni, T.B., L. Ryvarden and M.A.Q. Cavalcanti. 2004a. Studies in neotropical polypores 18. New species from Brazil. *Synopsis Fungorum* 18: 44–56.
- Gibertoni, T.B., L. Ryvarden and M.A.Q. Cavalcanti. 2004b. Poroid fungi (Basidiomycota) of the Atlantic Rain Forest in Northeast Brazil. *Synopsis Fungorum* 18: 33–43.
- Gibertoni, T.B., E.R. Drechsler-Santos, J.M. Baltazar, A.C. Gomes-Silva, G.S. Nogueira-Melo, L. Ryvarden and M.A.Q. Cavalcanti. 2011. The genus *Trichaptum* (*Agaricomycetes*, *Basidiomycota*) in Brazil. *Nova Hedwigia* 93(1-2): 85–96.
- Gilbertson, R. L. and L. Ryvarden. 1986. *North America polypores* vol. 1. Fungiflora, Oslo. 1–433p.
- Ginns, J. 1980 - The genus *Flaviporus* Murrill (Polyporaceae). *Canadian Journal of Botany* 58(14): 1578–1590.
- Gomes-Silva, A. C. and T. B. Gibertoni. 2009. Checklist of the aphyllorhizaceous fungi (*Agaricomycetes*) of the Brazilian Amazonian. *Mycotaxon* 108: 319–322.
- Gomes-Silva, A.C., L. Ryvarden and T.B. Gibertoni. 2011a. New records of *Ganodermataceae* (Basidiomycota) from Brazil. *Nova Hedwigia* 92(1-2): 83–94.
- Gomes-Silva, A.C., L. Ryvarden and T.B. Gibertoni. 2011b. Resupinate poroid fungi from tropical rain forests in Brazil: two new species and new records. *Mycol. Progress* 11: 879–885.
- Gomes-Silva, A.C., J. M. Baltazar, L. Ryvarden and T.B. Gibertoni. 2010. *Amauroderma calcigenum* (*Ganodermataceae*, *Basidiomycota*) and its presumed synonym *A. partitum*. *Nova Hedwigia* 90(3-4): 449–455.
- Groposo, C. and C. Loguercio-Leite. 2005. Contribution to the lignocellulolytic fungi (*Basidiomycetes*) of the Atlantic Rain Forest in Southern Brazil. *Mycotaxon* 92: 103–106.
- Góes-Neto, A. and I.G. Baseia. 2006. Filo *Basidiomycota*. In: Gusmão, L.F.P., Maia, L.C. (eds.) *Diversidade e Caracterização dos Fungos do Semi-Árido Brasileiro*. Recife, Associação Plantas do Nordeste II: 141–160.
- Gugliotta, A.M., M.C. Abrahão and T.B. Gibertoni. 2013. *Polyporales In Lista de Espécies da Flora do Brasil*. Jardim Botânico do Rio de Janeiro. Electronic database accessible at <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB121022>. Captured in July 2012.
- Holmgren, P.K., N.H. Holmgren and L.C. Barnett. 1990. *Index herbariorum. Part I: Herbaria of the World*. 86^a ed., New York Botanical Garden, Bronx. 120p.
- Jesus, M.A. 1996. Contribution to the knowledge of wood-rotting fungi in Brazil. II. Checklist of fungi from Maracá Island, Roraima State. *Mycotaxon* 57: 323–328.
- Lowy, B. 1952. The genus *Auricularia*. *Mycologia* 44: 656–692.
- Maas Geesteranus, R. A. 1974. Studies in the genera *Irpex* and *Steccherinum*. *Persoonia* 7(4): 443–581.
- Maia, L.C., E.R. Drechsler-Santos and M. Cáceres. Representatividade dos fungos nos herbários brasileiros; p. 189–194 In L.C. Maia, E. Malosso and A.M. Yano-Melo. 2007. (ed) *Micologia, avanços no conhecimento*.

- Congresso Brasileiro de Micologia 5. Recife: Editora Universitária UFPE.
- Masuka, A. J. and L. Ryvarden. 1999. *Dichomitus* in Africa. *Mycological Research* 103(9): 1126-1130.
- Pennington, R.T., D.E. Prado and C.A. Pendry. 2000. Neotropical seasonally dry forests and Quaternary vegetation changes. *Journal of Biogeography* 27:261-273.
- Queiroz, L.P., A. Rapini and A.M. Giulietti. 2006. *Towards Greater Knowledge of the Brazilian Semi-arid Biodiversity*. Ministério da Ciência e Tecnologia, Brasília. 142p.
- Ryvarden, L. 2004. *Neotropical polypores*. Part 1. Fungiflora, Oslo. 227p.
- Ryvarden, L. and I. Johansen. 1980. *A preliminary polypore flora of East Africa*. Oslo: Fungiflora. 633 p.
- Westphalen, M.C., M.A. Reck and R.M. Da Silveira. 2010. Polypores from Morro Santana, Rio Grande do Sul, Brazil. *Hoehnea* 37(3): 647-662.
- RECEIVED: September 2012
- ACCEPTED: June 2013
- PUBLISHED ONLINE: August 2013
- EDITORIAL RESPONSIBILITY: Matias J. Cafaro